

1/PRTS

09/554553
527 Rec'd PCT/PTO 15 MAY 2000

[10191/1378]

METHOD FOR TRANSMITTING INFORMATION AND TERMINAL DEVICE TO
RECEIVE DATA

Background Information

~~The invention relates to a method for transmitting~~
~~information and a terminal device for receiving data~~
~~according to the definition of the species of the~~
~~independent patent claims.~~ Methods for transmitting
information and terminal devices are already known in which
the data providers provide data services 4, 5 which are each
adapted to the data processing capabilities of terminal
devices 1, 2 (see Figure 1). Such systems are, however, very
inflexible.

Summary Of The Invention

Advantages of the Invention

~~The~~
~~In contrast,~~ the method according to the present invention
for transmitting information and the terminal device
according to the present invention for receiving data have
the advantage that the data services need no longer be
adapted individually to the capabilities of the terminal
devices. Rather, it is the case that the data can be
generated in a standardized format and can then be
correspondingly adapted by interfaces to the capabilities of
the terminal devices for data processing. Consequently,
terminal devices with varying capabilities can use the same
data service. Moreover, the configuration of the terminal
devices is simplified since essential functions now need
only be present once in the data providers. Since the
interfaces are only present with the data providers, errors
can be corrected very easily in a central location and the

adaptation to new terminal devices need take place only once.

a
a 5 ~~The measures described in the dependent patent claims make~~
~~advantageous improvements of the objects of the independent~~
a ~~patent claims possible.~~ A radio communications network, a
digital mobile telephone network in particular, is used
advantageously for the exchange of data. In this connection,
data can then be transmitted both from the terminal device
10 ~~to the service provider and in reverse direction.~~

Ans A17
AI
~~Drawings,~~

15 ~~Exemplary embodiments of the present invention are shown in~~
~~the drawings and are explained in greater detail in the~~
~~following description. Figure 1 shows a conventional method~~
~~of data exchange between terminal devices and service~~
~~providers and Figure 2 shows the method according to the~~
20 ~~present invention for exchanging data between a service~~
~~provider and terminal devices.~~

~~Description~~

25 Figure 1 shows an already known system for transmitting
information. This system has data users 1, 2 which, for
example, are designed in the form of terminal devices in a
motor vehicle, e.g., car radios with supplementary
functions. Data users 1, 2, i.e., terminal devices 1, 2, are
paired with a data provider 3, i.e., an infrastructure 3.
30 This data provider 3, i.e., infrastructure 3, generates data
which is transmitted to the data users via a transmission
medium 10. The transmission medium is represented by arrows
10 in this case. Data transmission medium 10 is conceived of

in particular as, for example, digital radio telephone systems such as the GSM mobile radio telecommunications system in this case. With the GSM mobile radio telecommunications system, it is possible to transmit data within the context of the Short Message Service. In addition, it is also possible to transmit data via the normal voice channels of the GSM mobile radio telephone, for example in the form of fax data. In this connection, as suggested by arrows 10, data can be transmitted not only by the data providers to terminal devices 1, 2 but terminal devices 1, 2 can also transmit data to data providers 3. In particular, this serves the purpose of requesting appropriate data from data providers 3 initiated by terminal devices 1, 2.

In Figure 1, data providers 3 have two different data services 4 and 5, each of which is adapted to terminal devices 1 and 2. These different data services 4, 5 can in fact have essentially the same functionality; however, they are adapted to the particular capabilities of terminal devices 1 and 2. Data services 4 and 5 may, for example, include drawing up a travel route for the user, taking the particular currently existing traffic situation into account. Accordingly, the users would enter their starting point and destination in terminal devices 1 and 2 and then transmit this data to service provider 3 via transmission medium 10 with a corresponding request to draw up a travel route. Data services 4 and 5 then generate the optimum travel route and transmit it back to terminal devices 1, 2 via transmission medium 10. Terminal devices 1, 2 differ from each other, however, essentially in the way this information can be displayed. Terminal device 1 has, for example, a small display and a voice output. The optimum

route would then be presented by the display of brief location data on the screen and the output of corresponding voice signals as needed. Terminal device 2 has, for example a large color screen. In this terminal device, the information concerning the optimum travel route would then be shown on the screen as a map with appropriate color markings. Due to the different capabilities of the terminal devices, different data services 4, 5 must be provided by the data providers, each being adapted to the data processing capabilities of terminal devices 1, 2.

A method according to the present invention for transmitting information between a data provider 3 and data users 1, 2 is shown in Figure 2. Terminal devices 1, 2 of transmission medium 10 and data providers 3 ^{correspond} ~~corresponding~~ to the corresponding elements from Figure 1. These terminal devices differ in particular with regard to their capabilities for processing data, in particular in the display on a screen or output in the form of speech.

The internal configuration of data provider 3 is different from Figure 1. Data provider 3 has only one data service 4 which is configured independently of the data processing capabilities of terminal devices 1, 2. Before the data is transmitted to the respective terminal devices 1, 2 via transmission medium 10, it is correspondingly adapted to terminal devices 1, 2 by interfaces 6, 7. It is the task of these interfaces 6, 7 to adapt the data provided by data service 4 to the capabilities of terminal devices 1, 2 and, correspondingly, to adapt to data service 4 the information sent by terminal devices 1, 2 to data provider 3. Interfaces are understood here to mean interface converters which are, for example, configured in the form of software and adapt

the data from the terminal device to the data service or in reverse direction. For example, terminal device 1 can have a voice input. This voice data is then transmitted to interface 6 and processed there into appropriate information for data service 4. For the example described above, this information can be the starting point and the destination of the planned trip. Using this data, data service 4 determines an optimum route and provides interface 6 with a large amount of information regarding the optimum route. If data service 4, for example, makes a map available, interface 6 converts this information into appropriate data for a brief written display or voice output in terminal device 1 since this corresponds to the capabilities for further data processing of terminal device 1. Therefore, only data in a format that can be processed by terminal device 1 is transmitted from interface 6 by communication medium 10. Terminal device 2 has a larger color screen, with the aid of which the user of terminal device 2 can enter a starting point and destination for his trip (for example, a touch screen). This data is transmitted via communication medium 10 to interface 7 which then generates appropriate input data for data service 4. Data service 4 accordingly draws up the route, in this case, for example, again in the form of a large map which cannot be displayed on the screen of terminal device 2 in that format and size. Interface 7 will then process this data appropriately by processing the map data that is not needed, for example, because the map section made available by data service 4 is too large, to conform to the format that can be displayed in terminal device 2. Only this data is then transmitted via interface 10 to terminal device 2, i.e., terminal device 2 receives in this case also only the data which it can reasonably process further.

The arrangement of the interface at data provider 3 results in the advantage that it is not necessary to create a separate data service for each terminal device 1, 2 which is adapted to the capabilities of the terminal device. Rather, the case is that one data service can be used for completely different terminal devices which may vary greatly with regard to their data processing capability. The expense for creating data services is thus reduced. Moreover, it is accordingly possible to design the terminal devices to be correspondingly simpler since the terminal devices do not need to be adapted to an already existing data service, but rather conversely, the data services are adapted to the capabilities of the terminal devices. This has the additional advantage that if additional terminal devices with new data processing capabilities are introduced, the already existing data services can be easily adapted to these new terminal devices. When new types of terminal devices appear, only the interfaces must be adapted to the new terminal devices.

It is not absolutely essential to arrange interfaces 6, 7 together with data service 4. It is just as conceivable for providers of communication medium 10, for example, operators of digital mobile telephone networks, accordingly to purchase data from service providers and then process it for their mobile telephone customers. In such a case the service provider shown in Figure 2 would thus be made up of two different providers which, however, from the customer's point of view exist as a single data provider 3.

The shifting of some of the functions from the terminal device to data provider 3 makes it possible for different terminal devices to use the same service. Moreover, the

terminal devices are thereby simplified since the necessary
extra expense for adapting different terminal devices to the
data service is incurred only once by the service providers.
In addition, this also makes it very easy to expand existing
5 services with additional functions. Only the interfaces
would need to be adapted accordingly. For terminal devices
with new display capabilities, only corresponding interfaces
need be set in place at the data providers. At the same
time, the already existing services can also be used. If
10 errors occur, they can be corrected very easily at a central
location at service providers 3 without the need for
exchanging the software in all the terminal devices. In
principle, it is therefore generally advantageous for the
data providers to adapt to the terminal devices and not the
15 reverse.

One option for transmitting the data processing capabilities
of the terminal device is to have only one terminal device
identifier or one terminal device code stored in the
20 terminal devices, the code then being transmitted to the
service providers. A list is stored in the interfaces or the
service providers which then permits the identification of
specific data processing capabilities.